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A revision of *Oldenburgia* (Asteraceae — Mutisieae)

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A revision of *Oldenburgia* Lessing (Asteraceae — Mutisieae) has been undertaken; four species are recognized. A key to the species is provided and a distribution map for each species is given.

'n Hersiening van *Oldenburgia* Lessing (Asteraceae — Mutisieae). Die geslag *Oldenburgia* is hersien en 4 soorte erken. 'n Sleutel tot die soorte en verspreidings-kaarte vir elke soort word aangebied.

Keywords: Asteraceae — Mutisieae, *Oldenburgia*, taxonomic revision

Introduction

Oldenburgia Lessing (Asteraceae — Mutisieae) is a genus of 4 species endemic to the Cape Province. Two have a shrubby growth form and favour habitats in mountain foothills while the other two have the growth form of cushion-plants and favour rocky montane habitats at higher altitudes. Since the last published revision by Harvey (1865) much additional herbarium material has accumulated including specimens of a very distinct undescribed species. The present revision updates the systematics of this ornamental and ecologically interesting genus.

Generic Description

Oldenburgia *Lessing* in Linnaea V: 252, f69 – 75 (1830): De Candolle. 7: 12 (1838); Harvey 3: 512 (1865); Marloth, 3, (2): 282 – 286 (1932); Dyer 1: 727 (1975). Type: *O. paradoxa* Lessing.

Low tree or dwarf shrubs with thick stems covered with the remains of old leaf bases. *Leaves* alternate, rosulate at ends of branches; obovate or elliptic, convex above, apex obtuse or sub-acute, base cuneate but expanded at junction with stem; densely silky-wooly, margin subrevolute; young leaves densely tomentose, adult leaves leathery, dark green and shiny above with impressed veins, lower surface densely tomentose with projecting and conspicuous veins. *Capitula* large, homogamous, radiate, sessile or pedunculate. *Involucre* ovoid, globose-urceolate or cyathiform. *Involucral bracts* 4 – 10-seriate, outer shorter than inner. *Receptacle* flat, epaleate, alveolate. *Ray florets* female, bilabiate, outer lip long, strap-shaped or tripartite, the inner lip of two delicate, linear-curled lobes; tube cylindrical; filaments filiform, stamens lanceolate, without apical appendages, bases sagittate, tailed; style terete, with very short branches; achenes fusiform elliptic or linear, glabrous and ribbed or villous; pappus of 11 – 30 plumose or barbellate bristles, often of unequal length. *Disc florets* numerous actinomorphic, tubular, deeply 5-lobed; stamens as in ray florets but with lanceolate sterile apices, gynoecium as in ray florets.

Chromosome number: 2n = 36 (Goldblatt 1987).

Derivation of the name

Named in honour of F.P. Oldenburg, who accompanied Thunberg and Masson on some of their travels in the Cape in the early 1770's. In 1774 he died of fever in Madagascar.

Diagnostic characters

The large leathery leaves, dark green above and densely tomentose below, the large capitula and the bilabiate female ray florets are distinctive features of the genus.

Distribution

A genus of four species endemic to the south-western, southern and south-eastern Cape. Three species occur on Table Mountain Sandstone in the south-western and southern Cape mountains. The fourth species is associated with outcrops of Witteberg quartzite in the Uitenhage and Grahamstown areas.

Key to the species of *Oldenburgia*

1 Tree or large shrub with glabrous achenes ..... (1) ***O. grandis***
1′ Densely-tufted dwarf shrubs with villous achenes
  2 Flower-heads sessile ..... (2) ***O. paradoxa***
  2′ Flower-heads pedunculate
    3 Peduncles simple, pappus barbellate ..... (3) ***O. intermedia***
    3′ Peduncles branched, pappus plumose .... (4) ***O. papionum***

1. Oldenburgia grandis *(Thunb.) Baillon*, Histoire des Plantes VIII: 97 (1882).

Arnica grandis Thunberg in Prodr. 154 (1800). Type: 'Cap', *Masson s.n.* in herb. Thunb. (UPS, microfiche seen).

Oldenburgia arbuscula De Candolle, Prodr. 7: 12 (1838). Harvey 3: 512 (1865). Type: Uitenhage, *Ecklon s.n.* (G, lecto., here designated, photo, NBG!)

Shrub or small tree 1 – 5 m with gnarled, rough, dark stems and branches. *Leaves* obovate or oblanceolate with obtuse or subacute apices, range up to 200 – 100 mm. *Peduncles* to 500 mm, densely tomentose, bearing several leaf-like bracts and 3 – 5 cymosely arranged capitula. *Involucre* cyathiform range up to 80 × 80 mm. *Involucral bracts* numerous, about 10-seriate, narrowly lanceolate and closely imbricate, but with reflexed acuminate tips, 15 – 40 mm long, about 3 mm wide at base, dark maroon with white-tomentose bases. *Ray florets* about 60, sub-uniseriate, white, tube *c.* 15 mm long, outer lip 3-toothed, 16 – 22 mm long, 2 mm wide, inner lobes 11 – 15 mm long, 0,5 – 1 mm wide; anthers about 14 mm long, including 4-mm long tails; style up to 35 mm long; achenes fusiform, glabrous, 10-ribbed, 12 – 15 mm long, 1,5 – 3 mm wide; pappus of about 18 barbellate bristles of uniform length and thickness, about 25 mm long. *Disc florets* about 800, white, tube 14 – 16 mm long, lobes 14 – 16 mm long; anthers 10 – 17 mm long, including 3 – 5-mm long tails, style 30 – 37 mm long; achenes as in ray florets except the pappus with 20 – 26 bristles about 30 mm long (Figure 1).

Flowering period: October to January.

Vernacular names: Rabbits' ears, bastersuikerbos, kreupelboom, wagenboom (De Candolle).

Figure 1 *Oldenburgia grandis*. (1) Vegetative shoot ×1/4; (2) peduncle and capitula ×1/3; (3) outer involucral bract ×2; (4) inner involucral bract ×2; (5) ray floret ×3; (6) disc floret ×3. From *Galpin* sub *NBG 87/15*.

Diagnostic characters: The tree-like form, large leaves and capitula and glabrous achenes distinguish *O. grandis* from all other members of the genus.

Oldenburgia grandis is always associated with outcrops of Witteberg quartzite and is found in the eastern Cape extending along the Suurberge near Somerset East to about 22 km east of Grahamstown — a range of some 200 km. It has been found that 'the fundamental cause of its occurrence only on Witteberg quartzite-derived soils is due to the fact that these soils have an optimal pH (4,3 – 4,5) and contain the required concentrations of phosphorus and aluminium for the establishment of the tree' (Olivieri 1977). This species occurs at altitudes

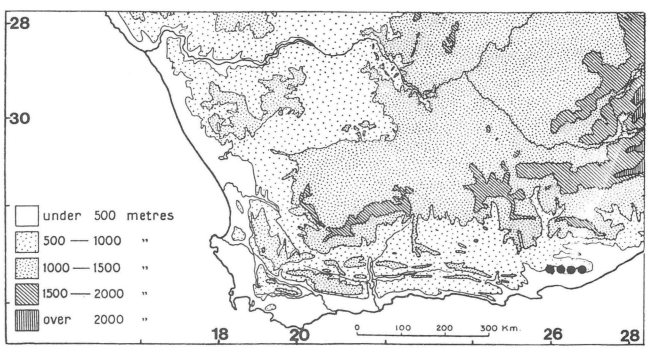

Figure 2 Distribution of *Oldenburgia grandis*.

of 500 – 690 m above sea level and in an area which receives most of its annual precipitation (approx. 600 mm) in summer (Figure 2).

Marloth (1932) has given a detailed illustrated account of the leaf anatomy of *O. grandis*.

This species has been successfully cultivated as an ornamental at Kirstenbosch Botanic Gardens since 1915.

Specimens examined

—**3325** (Port Elizabeth): farm Kaboega, Somerset East District, 915 m, Nov. 1973, *Bayliss BRI 667* (K, PRE); Suurberg Pass, Somerset East (Diaz divisional boundary) (– BD) Aug 1981, *Snijman 491* (NBG); Coega catchment basin, steep exposed SE, TMS rock, Aug 1976, *Scharf 1845* (PRE).

—**3326** (Grahamstown): Alicedale (– AC) Sept. 1917; *Cruden 310* (GRA); Dec. 1935, *Dyer 3347* (PRE); Highlands (– AD), Sept. 1902, *Daly & Sole 294* (GRA); Mountain tops, Howison's Poort, Grahamstown, 671 m, Dec. 1898, *Galpin 3076* (PRE); Zwartehoogde & Slaag Kraal, Oct., *Zeyher 3072* (BOL); Dassie Krans Nature Reserve (– BC), Oct. 1971, *Brink 241* (GRA); Grahamstown Nature Reserve, 500 m, Oct. 1970, *Dahlstrand 1979* (PRE, STE); North of Grahamstown (BOL, PRE); Rocky quartzite hills near Grahamstown, 671 m, Jan. – Feb., *MacOwan 1777* (BOL); In montibus solo quartzitico prope Grahamstown, 610 m; March 1887, *MacOwan Herb. Norm. 901* (BOL, K, SAM); May 1918, *Pole Evans H. 18283* (PRE), Dec. 1913, *Rogers 1165* (PRE); Op pad na Port Alfred, Apr. 1974, *Robbertse 963* (PRE).

Without precise locality: *Long 1078* (GRA, K, PRE); *Burchell 3387* (K); *Cooper 1543* (K, PRE); *Gill 24* (BOL); *Pappe* sub. *SAM 17237* (SAM). Ex hort: *Galpin* sub. *NBG 34929* (NBG); *Markötter* sub. *STE 26235* (STE).

2. Oldenburgia paradoxa *Lessing* in Linnaea V: 252 (1830). Harvey 3: 512 (1865). Type: 'in Capite bona spei', *Mund and Maire s.n.* (Not traced; description and figs 69 to 75 in Linnaea V tab III here designated as lectotype.)

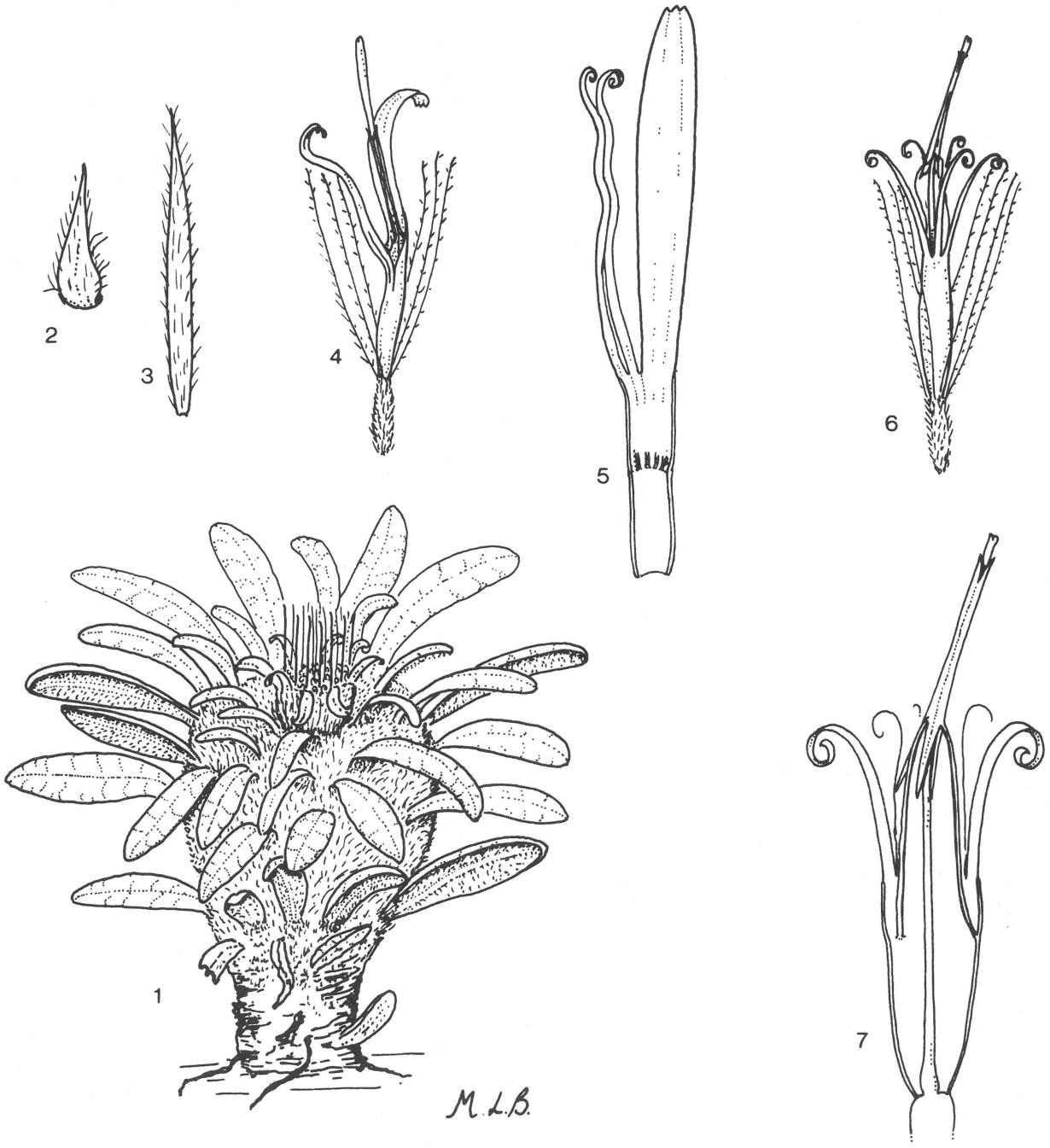

Figure 3 *Oldenburgia paradoxa*. (1) Flowering shoot, life size; (2) outer involucral bract ×2; (3) inner involucral bract ×2; (4) ray floret ×2; (5) perianth of ray floret ×3; (6) disc floret ×2; (7) perianth of disc floret ×3. From *P. Bond 1725*.

Dwarf cushion-forming shrub with thick woody branches and silky-woolly leaf-bases. Cushions up to 1 m square. *Leaves* narrow-elliptic, obtuse, 10 – 50 mm long, 3 – 12 mm wide. *Capitula* sessile. *Involucre* ovoid becoming campanulate with age. *Involucral bracts* almost hidden by the silky-woolly leaf-bases, 3 – 4-seriate, lanceolate, acuminate, up to 300 mm long, 15 mm wide, silky-woolly with glabrescent tips. *Ray florets* 8 – 22, white, tube 6 – 10 mm long, outer lip 3-toothed, 15 – 20 mm long, 2 – 3 mm wide, inner lobes 8 – 11 mm long, anthers 9 – 11 mm long including 3-mm long tails; style 25 – 30 mm long; achenes elliptic, dense-hairy, 5 mm long, 1,5 mm wide; pappus of 14 – 20 subplumose bristles, mostly about 17 mm long but several only 7 – 9 mm long. *Disc florets* about 80, white, appearing yellow in bud, tube 9 – 13 mm long, lobes 8 – 11 mm long; anthers 9 – 12 mm long, including 3-mm long tails; gynoecium as in ray florets (Figure 3).

Flowering period: January to October with a peak in April.

Diagnostic characters: The sessile capitula separate this from the three other species. It resembles most closely *O. intermedia* but has an ovoid involucre and fewer involucral bracts.

Lessing's types are mainly at CW (Stafleu & Cowan 1979) but no *Mund & Maire* material of *O. paradoxa* could be traced there. Searches for isotypes at other herbaria where *Mund & Maire* material is preserved (CGE, E, L, S, & P) were also fruitless. Accordingly, Lessing's original description, together with figures 67 to 75 of plate III in Linnaea V illustrating the type material and which are clearly diagnostic, are here designated to serve as the lectotype of the name.

O. paradoxa occurs on rocks of Table Mountain Sandstone, rooting in crevices and forming large cushions along the Riviersonderend and Langeberg ranges from Genadendal in the west to George in the east, a distance of some 300 km. The highest precipitation occurs in the winter months in the west and in the summer months in the eastern end of its range. It is found at altitudes of 600 to 1300 m. About 200 km separates the known records of *O. paradoxa* and *O. grandis* (Figure 4).

Specimens examined

—**3320** (Montagu): Stony slopes of Kogman's Kloof (– CC), Jan. 1918, *Thode 4709* (STE); NE slopes of Langeberg, 11 O'Clock Peak *c.* 1300 m (– CD), Feb. 1983, *Kotze & Parker 341* (NBG); Summit of a mountain peak near Swellendam, Jan. 1815, *Burchell 7365* (K); Zuurbrak Peak, 1220 m (– DC), Oct. 1925, *Barnard* sub. *SAM 29010* (SAM); Rocky ridge on Lemoenshoek Peak (– DD), Sept. 1944, *Esterhuysen 10505* (BOL); Strawberry Hill, between Lemoenshoek and Blaauwkrantz, Jan. 1957, *Stokoe* sub *NBG 100779* (NBG); Lemoenshoek Mts. near Heidelberg, March 1948, *Stokoe* sub *SAM 62097* (SAM).

—**3321** (Ladismith): Summit of Langeberg above Witte Els, 610 – 915 m, Oct. – Dec. 1913, *Muir 1129* (BOL, SAM); Summit of Kampsche Berg, Dec. 1814, *Burchell 7122* (K); Paardeberg, Albertinia (– DC), June 1952, *Van Rensburg 8* (NBG); Cloetes Pass Mtn. (– DD), Jan. 1940, *Stokoe s.n.* (BOL); Cloetes Pass, Herbertsdale, Jan. 1940, *Zinn* sub. *SAM 54610* (SAM).

—**3322** (Oudtshoorn): Robinson Pass (– CC) May 1933, *Salter 3260* (BOL); Apr. 1978, *Gibbon* sub *NBG 115635* (NBG); Feb. 1978, *W. Bond 1343* (NBG); Ruitersberg, 152 m above top of Robinson Pass, 915 m, *P. Bond 1725* (NBG); Cradockberg, George, 915 m (– CD), Apr. 1963, *Esterhuysen 30160* (BOL); Sept. 1814, *Burchell 5983* (K); Sept. 1897, *Galpin 4277*; Old Montagu Pass; Outeniquas, Apr. 1955, *Noel 915* (GRA); Waboomskraal near top of Outeniqua Pass, July 1954, *Rycroft 1644* (NBG); Summit of Georgetown Mtn., April 1903, *Prior* sub. *PRE 45302* (PRE), Cradock Peal and slopes, Montagu Pass, Jan. 1940, *Stokoe* sub. *SAM 54737* (SAM), Tolberg, George, July 1962, *Taylor 3523* (STE); Roode Els Kloof side, Kammannasie Mts. 1036 m (– DB), Oct. 1978, *Matthews 297* (PRE).

—**3323** (Willowmore): Avontuur, Uniondale Dir. (– CA), Jan. 1940, *Stokoe* sub. *SAM 57006* (SAM).

—**3419** (Caledon): Inter saxa in cliv. merid. montis pone Genadendal (– BA), Jan. 1885, *H. Bolus Herb. Norm. 374* (BOL, SAM); Greyton, Perdekop, 915 m, June 1982, *Viviers 423* (NBG); Rivier Zonder Einde by Appelskraal (– BB), Sept., *Zeyher 3073* (BOL; in Montibus Rivier Zondereinde in ditione Caledon, Sept., *Zeyher* sub *SAM 17236* (SAM); Oudebos, Zonderend Mts. (– BD) Apr. 1930, *Stokoe* sub. *Marloth 13679b* (PRE, STE); Baardscheerdersbosch between Elim and Gansbaai (– DA), Oct. 1947, *Stokoe* sub. *SAM 62096* (SAM).

—**3420** (Bredasdorp): South slopes, Swellendam Mt. (– AB), Feb. 1941, *Esterhuysen 4799* (BOL); on 'The Crown', Swellendam, on rock facing north, 1402 m, Apr. 1952, *Wurtz 63* (NBG); Near Swellendam, May 1929, *Thirling & Neil 13679* (PRE).

Without precise locality: Peak in Langeberg Mts., Swellendam, 1220 m, Oct. 1952 *Dekenah s.n.* (NBG).

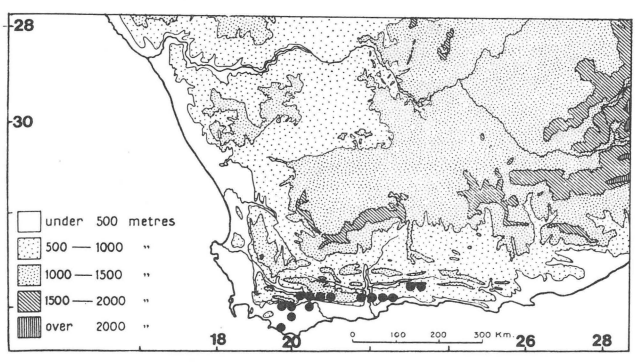

Figure 4 Distribution of *Oldenburgia paradoxa*.

3. Oldenburgia intermedia *Bond* sp. nov. Affinis *O. paradoxa* Less. sed pedunculo 90 – 220 mm longo et involucra globoso-urceolato.

TYPUS. — Bergriviernek, Jonkershoek, about 1000 m, 29/3/1982, *P. Bond 1723* (NBG, holotypus!; K, MO, PRE, isotypi!)

Dwarf cushion-forming shrub with thick woody branches and silky-woolly leaf-bases. Cushions up to 600 mm in diameter, often less. *Leaves* narrow-elliptic, obtuse, 20 – 55 mm long, 7 – 17 mm wide. *Peduncle* 90 – 220 mm long, floccose with several very reduced leaves, with a single capitulum. *Involucre* globose in bud, globose-urceolate in flower, 20 – 32 mm long, 20 – 30 mm wide. *Involucral bracts* 4 – 6-seriate, ovate to lanceolate, 10 – 20 mm long, 1 – 2 mm wide, densely woolly except for the glabrescent tips. *Ray florets* sub-uniseriate, 30 – 35, white, occasionally tinged pink or with pink tips; tube 10 – 13 mm long, outer lip 3-toothed 17 – 20 mm long, inner lobes about 12 mm long; anthers 8 – 10 mm long, including 2 – 3-mm long tail; style 24 – 28 mm long, achenes elliptic, densely hairy, 7 mm long, 1,5 mm wide; pappus of about 25 barbellate bristles, mostly 17 mm long, a few slender and only 6 mm long. *Disc florets* about 80, white, occasionally with pink tips, soon fading to light brown, tube 10 – 13 mm long, lobes 12 – 15 mm long; anthers about 11 mm long, including 2-mm long tails; style 30 – 33 mm long; achenes elliptic, densely hairy, 10 – 12 mm long, 2 mm wide, pappus of 25 – 30 barbellate bristles, mostly 17 mm long but a few slender ones only 6 mm long (Figure 5).

Flowering period: December to April with a peak in March.

Diagnostic characters: Though similar to *O. paradoxa* in its cushion-forming habit, *O. intermedia* is distinct on account of its prominently pedunculate inflorescences (peduncle 90 – 220 mm long) bearing a single capitulum, the globose-urceolate involucre and the greater number of involucral bracts.

O. intermedia forms smaller cushions than *O. paradoxa* but also grows in sandstone rock crevices. It is found at altitudes of 600 to 1500 m on mountains from the Hottentots

Holland in the south to the Cedarberg in the north and the Hex River Mountains in the north-east. It has not yet been reported from localities where *O. paradoxa* or *O. papionum* grow. This is an interesting disjunct distribution and especially strange in view of the fact that only about 50 km separates the known records of *O. paradoxa* and *O. intermedia*. The presence of *O. intermedia* (*Oliver 5924* and *Boucher 4268*) on large rocks beside the Palmiet River below Stokoe's Hill in the Kogelberg reserve, is probably due to plants or rocks having been brought down by flood waters from the mountains above the valley (Figure 6).

Specimens examined

—**3219** (Wuppertal): Rocky slopes of Schurweberg Peak, south of Boboskloof (–CD), Feb. 1968, *Esterhuysen 31920* (BOL).

—**3318** (Cape Town): Cliffs on east side of Simonsberg, 1067 m (–DD), May 1943, *Esterhuysen 8813* (BOL, PRE); 1220 m, March 1956, *Esterhuysen 25464* (BOL); Banhoek Spitzkop, 1250 m, Sept. 1945, *Esterhuysen 11888* (BOL); Guardian Peak, Stellenbosch Div., May 1942, *Esterhuysen 7834* (BOL); *c.* 1189 m, March 1972, *Taylor 8080* (STE); Swartboskloof, Stellenbosch, 1220 m, Feb. 1963, *v.d. Merwe 1295* (PRE, STE); *c.* 1524 m, Sept. 1960, *Van Rensburg 327* (STE); Jonkershoek Twins, 915–1220 m, March 1943, *Esterhuysen 8798* (BOL); slopes of Witbrug, Jonkershoek State Forest *c.* 640 m, March 1973, *Hanes*

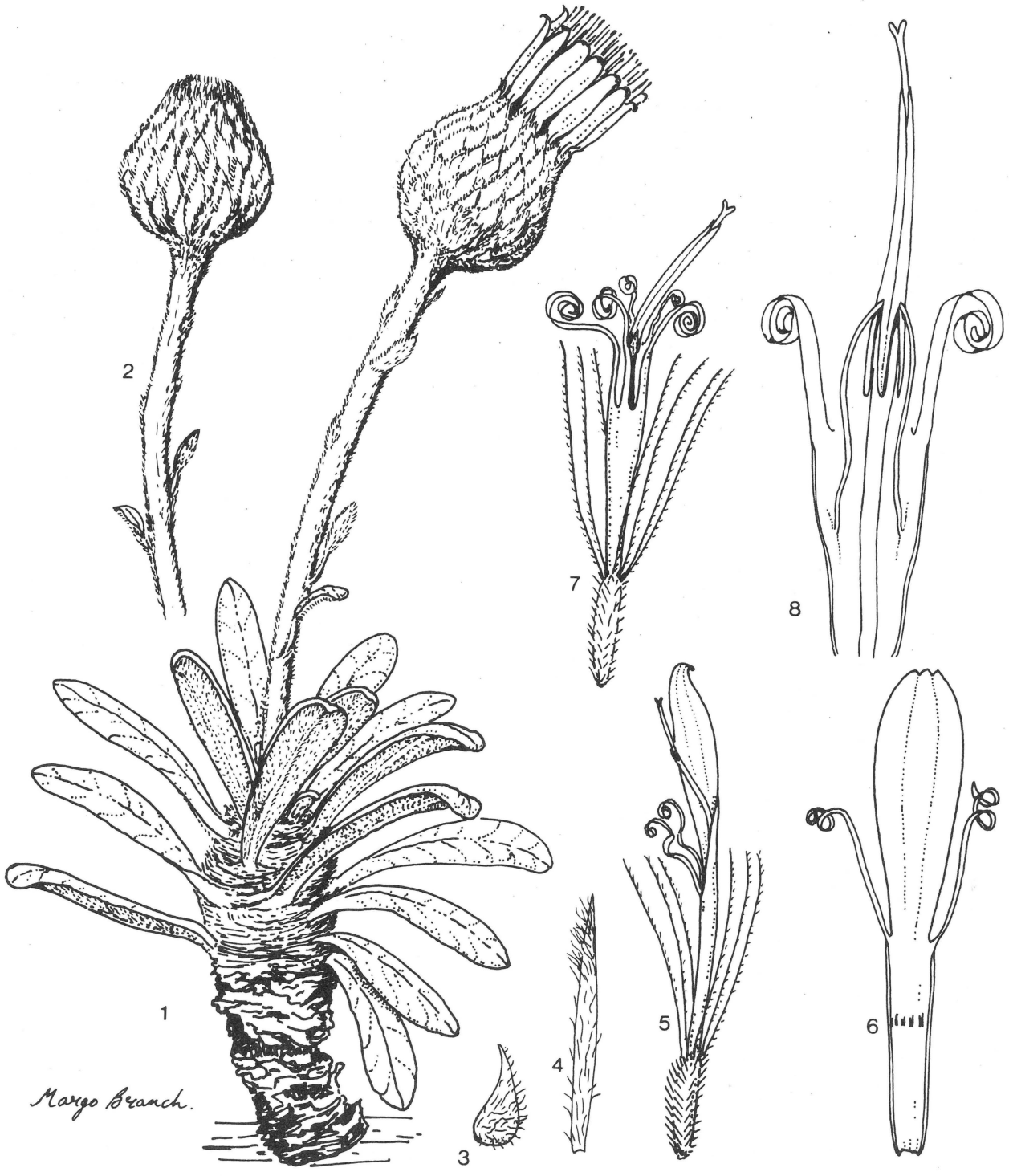

Figure 5 *Oldenburgia intermedia*. (1) Flowering shoot, life size; (2) bud, life size; (3) outer involucral bract ×2; (4) inner involucral bract ×2; (5) ray floret, side view ×2; (6) ray floret, showing bilabiate perianth ×3; (7) disc floret ×2; (8) perianth of disc floret ×4. From *P. Bond 1723*.

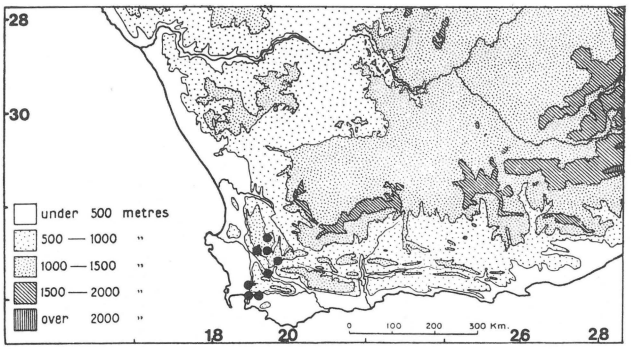

Figure 6 Distribution of *Oldenburgia intermedia*.

788 (PRE, STE).

—**3319** (Worcester): Olifants River Mts., ridge just south of Groen (– AA), 1067 – 1220 m, Dec. 1946, *Esterhuysen 13481* (BOL); Schoongezicht Peak, Cold Bokkeveld Mts., Ceres (– AB) Apr. 1953 *Esterhuysen 21276* (BOL, PRE); Matroosberg, 1524 m (– BC), Apr. 1958, *Esterhuysen 27663* (BOL); French Hoek in montibus, 915 m (– CC), Nov. 1896, *Schlechter 9308* (BOL); South-eastern side of French Hoek Mtns., Jan. 1949, *Stokoe* sub. *SAM 62098* (SAM); South aspect, mts. south of Roberts Vley, Paarl Div., Feb. 1933, *Pillans 6786* (BOL); Summit of mt. edge between Jonkers Hoek Valley and Lourensford, Feb. – Apr., 1925, *Pillans* sub. *BOL 18428* (BOL); Nek at head of Jonkershoek Valley, Jan. 1948, *Rodin 3265* (BOL); Bushman's Castle Mt., French Hoek Div., 1128 m, Apr. 1927, *Stokoe s.n.* (BOL); Berg River Hoek rock faces, 915 m, Oct. 1942, *Compton 13813* (NBG); At the head of Jonkershoek Valley, 1067 m, March 1967, *Rourke 736* (NBG); approx. 200 m to left of Berg River Nek *c.* 1064 m, March 1982, *Bond 1723* (NBG); Assegaaibosch Nek, Jonkershoek, 1158 m, Jan. 1968, *Kerfoot K6210* (STE).

—**3418** (Simonstown): Hottentots Holland Mts. east of The Triplets (– BB), Dec. 1939, *Esterhuysen 3586* (BOL); Somerset West Triplets, 1067 – 1220 m, April 1949, *Esterhuysen 15246* (BOL); In crevices on rock faces on Helderberg, 915 m, Nov. 1948, *Esterhuysen 14670* (BOL); Pic-Sans-Nom. 915 m, Jan. 1944, *Esterhuysen 9812* (BOL); From crevices in cliffs, Stellenboschberg, March 1982, *Esterhuysen 35750* (BOL, NBG); Sir Lowry's Pass along ridge west of top of Pass, 549 – 610 m, Sept. 1969, *Esterhuysen 32181* (BOL); May 1983, *Bond 1734* (NBG); Near Diep Gat, Nov. 1946, *Stokoe* sub *SAM 60517* (SAM); Kogelberg State Forest, Palmiet River in crevices in large boulder in river bed, 91 m (– BD), Dec. 1978, *Boucher 4268* (STE); May 1975, *Oliver 5924* (STE).

—**3419** (Caledon): Dwarsberg, Jonkershoek Forest Reserve *c.* 1097 m (– AA), Feb. 1952, *Rycroft 1263* (NBG), 1220 m, March 1967, *Kruger KR 399* (STE).

Without precise locality: Clanwilliam, Dec. 1915, *Edwards* sub *NBG 2994/14*, (BOL); Jonkershoek prope Stellenbosch 1200 m, Jan. 1888, *Marloth 1834*.

Doubtful locality: Tulbagh, Jan., *Marloth 8656*.

4. Oldenburgia papionum *De Candolle*, Prodr. 7: 12 (1838). Harvey 3: 513 (1865). Type: 'Berge bei Tulbagh R III' *Drège 1835* (G., lecto, here designated; photo NBG!).

Scytala papionum E. Meyer in Hb. Drège — nom. nud.

Low shrub with short, thick stem marked by leaf scars. *Leaves* about 11 in each apical tuft, obovate-oblong, 78 – 260 mm long, 12 – 75 mm wide. *Peduncle* 456 – 900 mm long, tomentose to glabrescent, bearing several reduced leaves and 1 – 3 cymosely arranged capitula. *Involucre* cyathiform in bud, globose-urceolate in flower, 40 – 55 mm long, 40 – 70 mm wide. *Involucral bracts* 5 – 7-seriate, lanceolate, 12 – 17 mm long, tightly bound together with silky-wool. *Ray florets* 20 – 40, white, tube 8 – 9 mm long, outer lip entire or deeply 3-partite, 12 – 16 mm long, inner lobes 7 – 9 mm long, all lobes pubescent; anters 8 – 9 mm long, including 3-mm long tails; style 16 – 22 mm long, achenes linear, densely hairy, 5 – 8 mm long, 1 mm wide; pappus of 11 – 14 plumose bristles, 11 – 13 mm long. *Disc florets* about 500 – 1000, cream or pinkish-brown, appearing yellow in bud, tube 12 mm long, lobes *c.* 5 mm long; anthers 9 – 10 mm long, including 2 – 4-mm long tails; style 19 – 23 mm long, achenes linear, densely hairy 9 – 12 mm long, 1 – 1,50 mm wide (Figure 7).

Flowering period: March.

Diagnostic characters: *O. papionum* is distinguished by its long, branched, glabrescent scape, and tufted, but not cushion-forming habit.

Oldenburgia papionum has a limited range, occurring in the du Toit's Kloof and Bains Kloof Mountains as far north as the Tulbagh Waterfall, a distance of about 45 km. It is found at lower altitudes (250 – 450 m) than the other three species. It is conspicuous in flower with its tall slender peduncles rising above the low tufts of leaves on rocky sandstone outcrops (Figure 8).

Specimens examined

—**3319** (Worcester): Tulbagh Waterfall (– AC), Nov. 1941, *Compton 12460* (NBG); in saxosis montium Drakensteenbergen prope cataractam Tulbaghensem, 305 m, Mar. 1886, *H. Bolus Herb. Norm. No. 402* (BOL, K, SAM); In saxosis montium supra cataractam Tulbaghsensem, *c.* 457 m, March 1885, *H. Bolus 5410* (BOL, PRE); West slope of Vogelsvlei Mts., near Gouda on rocks and cliffs, Sept. 1951, *E. Esterhuysen 18821* (BOL); Rocky places above Tulbagh Waterfall near the stream, Feb. 1979, *Cameron and Manchip 14* (BOL); Ad pedum montium circa pagum Ceres (– AD), 457 m, March 1883, *H. Bolus 3048* (SAM); Du Toits Kloof, Worcester (– CB), March 1962, *I. Walters 5* (NBG); Wagenheim farm near turnoff to Rawsonville, 900 m, Apr. 1980, *P. Bond 1712* (NBG); *P. Bond 1721* (NBG).

Without precise locality: Robertson Mts., March 1920, *de Bruijn* sub *Marloth 9496* (PRE).

Relationships

Oldenburgia Lessing is a member of the subtribe Gochnatiinae, one of the four subtribes of the tribe Mutisieae, accepted by Cabrera (1977). Gochnatiinae have many discoid genera and all disc florets are actinomorphic. There is a high percentage of arborescent or shrubby species and the subtribe has a wide distribution; all factors which indicate a primitive position in the Mutisieae. *Oldenburgia* appears to occupy an isolated position within this subtribe and is apparently not closely related to other African members of the subtribe which include *Erythrocephalum, Achyrothalamus, Pasaccardoa, Pleiotaxis* and *Dicoma*. *Erythrocephalum* has a paleate receptacle and very reduced pappus, while in *Achyrothalamus* the pappus is absent. *Pasaccardoa* comes closest to *Oldenburgia* in floral characters but has a paleate receptacle and the three species of *Pasaccardoa* are annuals, although it is possible that one undescribed species may be a perennial herb. *Pleiotaxis* and *Dicoma* lack ray florets and are generally very different from *Oldenburgia*. Affinities of *Oldenburgia* most likely lie with South American genera of Gochnatiinae, including *Wunderlichia, Chimantaea* and *Cnicothamnus*.

The capitulum of *Cnicothamnus lorentxii* Griseb. from Argentina is very similar to that of *O. intermedia*, the most obvious difference being the presence of only one lower lobe in the ray florets. *Cnicothamnus* also has arborescent or shrubby species and large leaves. This genus shows a stronger link with *Oldenburgia* than do any of the known genera of Mutisieae on the African continent.

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Figure 7 *Oldenburgia papionum*. (1) Vegetative shoot, life size; (2) peduncle and capitula, life size; (3) inner involucral bract ×2; (4) outer involucral bract ×2; (5) disc floret ×2; (6) anther ×3; (7) ray floret ×2; (8) style ×2. From *P. Bond 1721*.

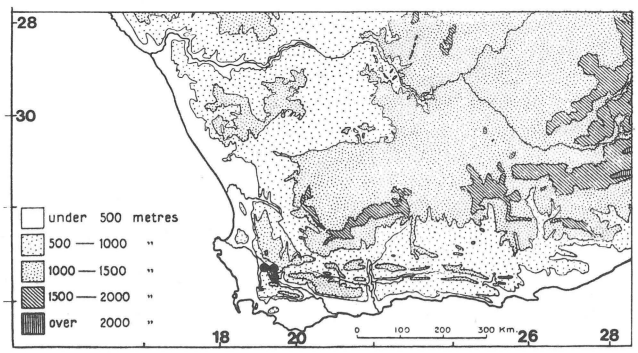

Figure 8 Distribution of *Oldenburgia papionum*.

STE. Dr J.P. Rourke kindly photographed material in the herbarium at G. My thanks are also due to the curators of CGE, E and L, who searched their collections for the type specimens of *O. paradoxa*.

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